WHAT IS CLAIMED IS:

1. A method for training a time-domain equalizer having at least one coefficient, comprising:

estimating a channel;

initializing the at least one coefficient of the time-domain equalizer;

updating the at least one coefficient of the time-domain equalizer with the estimated channel;

retaining the updated estimated channel;

fixing the updated value of the at least one coefficient of the time-domain equalizer for at least a one-symbol duration;

calculating a modulated symbol based on an output of the time-domain equalizer;

calculating a second value for the estimated channel based on the modulated symbol;

setting the estimated channel to the second value; and

repeating the step of updating the time-domain equalizer through the step of setting the estimated channel to the second value until a predetermined condition has been met.

2. The method as claimed in claim 1, further comprising a step of calculating the energy of the channel.

3. The method as claimed in claim 1, wherein the step of updating the time-domain equalizer includes updating the time-domain equalizer with a least-mean-square algorithm.

4. The method as claimed in claim 1, further comprising a step of fixing the updated value of the at least one coefficient of the time-domain equalizer for at least a two-symbol duration.

5. An asymmetric digital subscriber line system including a transmitted signal having a plurality of training symbols, comprising:

a channel for receiving the transmitted signal;

a target channel for receiving the transmitted signal;

a first mixer coupled to the channel for receiving an output of the channel;

a time-domain equalizer coupled to the first mixer to receive an output of the first mixer, the time-domain equalizer including a plurality of coefficients;

a first modulator coupled to the time-domain equalizer to provide a first modulated signal;

a channel estimator, coupled to the first modulator to receive the first modulated signal, providing an estimated channel to the target channel; and

a second mixer, coupled to receive the output of the time-domain equalizer and an output of the target channel, providing an output to the time-domain equalizer.

6. The system as claimed in claim 5, wherein the first modulator includes a first encoder coupled to received an output of the time-domain equalizer, and a first Fast Fourier Transform means coupled to the first encoder to provide the first modulated signal.

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7. The system as claimed in claim 5, further comprising a second modulator coupled to receive the transmitted signal, the second modulator providing a second modulated signal.

8. The system as claimed in claim 7, wherein the second modulator includes

a second encoder for receiving the transmitted signal; and

a second Fast Fourier Transform means, coupled to the second encoder, providing the second modulated signal to the channel estimator.

9. The system as claimed in claim 5, wherein the first mixer providing circular convolution between the channel and the training symbols of the transmitted signal.

10. The system as claimed in claim 5, wherein the second mixer providing circular convolution between the estimated channel and the coefficients of the time-domain equalizer.

11. The system as claimed in claim 7, wherein the channel estimator includes a divider for dividing the first modulated signal from the second modulated signal.

12. The system as claimed in claim 7, wherein the channel estimator includes a memory for storing an inverse value of the second modulated signal.

13. The system as claimed in claim 7, wherein the channel estimator includes a multiplier for multiplying the first modulated signal with the inverse of the second modulated signal.

14. The system as claimed in claim 5, wherein the channel estimator delays the estimated channel by at least one symbol.

15. The system as claimed in claim 5, wherein the channel estimator delays the estimated channel by at least two symbols.

16. The system as claimed in claim 5, wherein the time-domain equalizer comprises an L-tap adaptive FIR filter.

17. A discrete multi-tone transceiver, comprising:

a channel estimator for receiving a first modulated signal and a second modulated signal, including

a first calculating means for estimating an effective channel in the frequency domain based on the first and second modulated signals,

an inverse Fast Fourier Transform means coupled to the first calculating means for converting the effective channel to the time domain, and

a rectangular windowing means coupled to the inverse Fast Fourier Transform means for providing a rectangular windowing function on the effective channel in the time domain to limit the estimated channel to v+1 samples.

18. The transceiver as claimed in claim 17, further comprising a second calculating means for normalizing an energy of the estimated channel.

19. The system as claimed in claim 17, wherein the first calculating means includes a divider for dividing the first modulated signal from the second modulated signal.

20. The system as claimed in claim 17, wherein the first calculating means includes a memory for storing an inverse value of the second modulated signal, and

a multiplier for multiplying the first modulated signal with the inverse of the second modulated signal.

21. A method for training a time-domain equalizer having at least one coefficient, comprising:

receiving a first modulated signal in the frequency domain;

receiving a second modulated signal in the frequency domain;

estimating an effective channel in the frequency domain based on the first and second modulated signals;

converting the effective channel to the time domain; and

rectangular windowing of the effective channel in the time domain to limit the estimated channel to v+1 samples.

22. The method as claimed in claim 21, further comprising a step of normalizing an energy of the estimated channel in the time domain.

23. The method as claimed in claim 21, wherein the step of estimating an effective channel comprises dividing the first modulated signal from the second modulated signal.

24. The method as claimed in claim 21, wherein the step of estimating an effective channel comprises multiplying the first modulated signal with the inverse of the second modulated signal.

25. The method as claimed in claim 21, wherein the step of estimating an effective channel is delayed for a duration of at least one symbol.

26. The method as claimed in claim 21, wherein the step of estimating an effective channel is delayed for a duration of at least two symbols.

27. The method as claimed in claim 21, further comprising a step of updating a plurality of coefficients of a time-domain equalizer with the windowed estimated channel in the time domain.

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